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Work-Family Typologies and Mental Health Among Women in Early Working Ages

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Abstract

Better mental health is observed among women with a partner, children, or employment as compared with women without a partner, children, or employment, respectively. Moreover, women who fulfill all three roles are generally healthier than those with fewer roles. Because of significant changes in work-family life constellations over age, understanding these health differentials requires a life course approach. We linked work-family trajectories to mental health in mid-life for Finnish women using longitudinal registry data. Panel data from an 11% random sample of the population residing in Finland in any year between 1987 and 2007 and followed up until 2013 were used. Work-family combinations were based on partnership status, motherhood status, and employment status. Purchases of prescribed psychotropic medication were used as a measure of mental health. We used sequence analysis to identify 7 distinct groups of women based on their work-family trajectories between ages 20 to 42 years. The associations of typologies of trajectories with mental health at age 43 years were estimated with logistic regression models. Compared to employed mothers with a partner, all other women were more likely to have purchased any psychotropic medication at age 43; especially women without a partner, children or employment and lone mothers had worse mental health. These disadvantages remained after controlling for psychotropic medication purchases earlier in life (to account for potential health selection). Adjusting for age at motherhood did not contribute to the better mental health of employed mothers with a partner. Women combining partnership, motherhood, and employment during early working ages had better mental health later in life than women with other work-family trajectories even after adjusting for mental health earlier in life. Interventions to improve the mental health of women living alone in mid-life, including lone mothers, and individuals without employment, may be needed.

Keywords: Work-family life; Mental health; Finland; Life course approach; Sequence analysis; Psychotropic medication use

Ethics approval

The use of the data for research purposes has been approved by the ethical committees of the Finnish register authorities: Statistics Finland (permission 'TK-53-1519-09') and the Social Insurance Institution of Finland (permission 'Kela 36/522/2010').

Introduction

Individuals living with a partner, who have children or who are employed generally have lower mortality rates, better health, and engage in healthier behaviors than individuals without a partner, without children in the family and without employment, respectively.[1–3] Previous studies also reported mental health benefits of marriage and cohabitation, suggesting that the mental health of individuals living with a partner is better than those not living with a partner.[4–13] But mixed results have been found with regards to the relationship between parenthood and mental health; some studies reported worse mental health among parents than non-parents,[14,15] whereas other studies reported better health[2,16,17] or no mental health differences between parents and non-parents.[14,18] Better mental health has also been observed among employed individuals.[3,19–22] It is found to persist across race, marital status, and life course stage,[3,22] and the longer a woman's employment, the better it is for her health.[22,23]

Combining partnership, parenthood, and employment

These different dimensions of family and work life are likely to not be independent from each other in their influence on health. Combining partnership, parenthood, and employment may influence an individual's health in different ways. On the one hand, having multiple roles may positively influence a woman's health (*the role accumulation hypothesis*); as employment provides social support and more financial independence, this is associated with better health.[24,25] This hypothesis has been supported by several studies,[22–28] and the health benefits from combining multiple roles remained after controlling for the selection of healthier individuals into having multiple roles.[22,23] On the other hand, the competing demands of combining employment, marriage, and parenthood, and the stress resulting from that, may negatively influence health (*the multiple role hypothesis*).[24,25,29] Nevertheless, (mental) health may largely be affected by the time spent in specific work-family states; their positive or negative health effects may be cumulative. For example, the (mental) health disadvantage

experienced by women who were a lone mother for most of their early working life may be different than that experienced by lone mothers whom (re)partnered quickly and were thus able to benefit from having a partner. Adopting a life course approach is therefore important as work-family life changes over an individual's life, but also the meaning of certain work-family combinations may change over the life course.

Women's work-family life and health later in life

The link between work-family trajectories and health outcomes later in life has received increasing attention in recent years. For example, findings from a study by Nordenmark[27] suggested that the number of social roles an individual has, as well as an increase in this number over time, is negatively associated with risk of suffering from insomnia or a long-lasting illness, or taking medication for a lingering illness on a regular basis. Hewitt and colleagues[30] found that combining a family with no employment or part-time employment was associated with better self-reported health among Australian women, whereas combining children with full-time employment had a negative impact on self-reported health. Using data from the Household, Income and Labour Dynamics in Australia survey, O'Flaherty and colleagues[31] found that among women, only those with a disrupted marital history and high fertility had poorer physical health. Johansson and colleagues[32] found no clear differences in health and well-being among Swedish women with different life courses based on work and family activities during early working ages. Findings from a study by Kostiainen and colleagues[28] suggest that among Finnish women aged 30 to 49 years having multiple roles was associated with good self-rated health. Lacey and colleagues[33] found that married mothers with weak ties to the labor market had lower self-reported well-being, even after adjusting for well-being at childhood, using data from the 1946 British birth cohort. Additionally they found that life satisfaction was lower among women with weaker ties to the labor market, as well as women without children. Findings from another study by Lacey and colleagues[34] also based on data from the 1946 British birth cohort suggest that among women with full-time employment having a family earlier or later did not result in

differences in metabolic profile in mid-life. Using data from the 1946 British birth cohort, McMunn and colleagues[35] found that women with fewer roles than those of employee, spouse, and mother reported worse health. Using data from the 1958 British birth cohort, Lacey and colleagues[36] found that women with work-family trajectories characterized by early entry into parenthood and weak work ties were more likely to have chronic inflammation in mid-life than men and women who had children later or who had stronger ties to paid work. Using the same dataset, McMunn and colleagues[37] found that women in work-family trajectories characterized by earlier transitions to family life had higher metabolic risks, irrespective of the strength of their ties to the labor market or their marriage stability. McMunn and colleagues[38] found in another study that role quality explained the poorer subjective health among lone mothers, but not among long-term homemakers or childless women, using data from the 1946 British birth cohort. Using data from the English Longitudinal Study on Aging, Benson and colleagues[39] found that women with a family who took a long career break were more likely to report depressive symptoms but had a lower mortality rate, whereas women who took shorter career breaks were less likely to report disability later in life. Using data from the Health and Retirement Study in the United States, Sabbath and colleagues[40] found higher mortality risks among single nonworking mothers, single working mothers and married nonworking mothers, compared to married mothers who stayed home for only a short period before returning to work. Sabbath and colleagues[41] additionally found that women who experienced spells of single motherhood between ages 18 and 50 years had the highest mortality risk, particularly previously married women who became single mothers later in life and who had low job control. Using data from the Survey of Health, Aging and Retirement in Europe and the Health and Retirement Study in the United States, Van Hedel and colleagues[42] found that compared to working married mothers, women with other work-family trajectories were more likely to have been diagnosed with heart disease (working single mothers) and stroke (working single mothers and married mothers who returned to work after some non-employment).

Most studies linking work-family trajectories and health have focused on health at older ages and health outcomes other than mental health using self-reported data. A selection of studies included work-family trajectories with annual measures[31–34,36,37,39–43] or included previous health measures[31,33–37,39,43] to account for possible health selection into specific work-family life courses.

Aim of this study

The aim of this study is to investigate mental health differences of women in mid-life who experienced different work-family trajectories in early working ages, using longitudinal Finnish registry data. Our study adds to the current literature in multiple ways. First, we used longitudinal registry data that does not rely on self-reported data and only suffers from attrition due to death and emigration, but not non-response. Second, work-family trajectories with annual information during the follow-up is available, allowing us to look at the overall trajectory rather than specific work-family combinations at certain ages. Third, we control for pre-existing health, thus taking into account some of the possible health selection effects into specific work-family trajectories. This study focused on women, because women are most likely to feel competing work and family life demands. Even though female labor force participation has increased substantially in recent decades, women still take up most of the core housework work and spend more time with the children than do men.[44,45] We used sequence analysis to construct work-family typologies based on trajectories observed at ages 20 to 42 years and logistic regression models to study the association of these typologies with mid-life mental health at age 43.

Data and methods

Sample

An 11% random sample representative of the population residing in Finland at the end of any of the years 1987 to 2007, followed until the end of 2013, was used. This sample was linked to data from official registries, such as the labor market data file and medication records, on an individual level by

using a unique personal identification code. All purchases of any prescribed medication were recorded from 1995 onwards, including purchase dates, the type of drug, and the amount purchased. We restricted the sample to women born between January 1 1967 and December 31 1970 (n=14997 women), to allow for the estimation of work-family trajectories between ages 20 to 42 for women from multiple birth cohorts. In total, 1443 women were missing information on at least one year between ages 20 to 42. Of these women, 172 died during the follow-up period and 1271 women were not living in Finland for at least one year resulting in a gap in their follow-up. After excluding these women, our sample consisted of 13554 women with fully observed work-family trajectories. Descriptive information for selected variables for women included and excluded from the sample is provided in Table A of the supplemental materials.

Mental health

Mental health was measured based on purchases of prescribed psychotropic medication. In our study, psychotropic medication included antidepressants (Anatomical Therapeutic Chemical [ATC] codes[46] starting with N06A), antipsychotics (ATC codes starting with N05A), and anxiolytic/sedative/hypnotic (ASH) medication (ATC codes starting with N05B or N05C). The outcome was binary; i.e. whether or not a woman purchased at least one prescription of psychotropic medication in the year she turned 43 years. For example, this would be purchasing at least one psychotropic medication in 2010 for a woman born in 1967, at least one purchase in 2011 for those born in 1968, and so on. Mental health earlier in life (at ages 28 to 32), representing possibly pre-existing mental health problems, was measured similarly.

Work-family variables

Work-family trajectories were based on three dimensions of work and family life: partnership, parenthood, and employment. We defined partnership status as living with a married or cohabiting partner. Individuals were identified as cohabiting when they lived in the same dwelling as their partner

of opposite sex, who was not a married spouse or a sibling, and with whom the age difference did not exceed 15 years. Individuals not in a partnership included those living with at least one adult other than a partner (e.g., a parent, friend or sibling), those not living with other adults (e.g., living alone or lone parents), and those with an unknown living arrangement status. Parenthood status was defined as having at least one co-resident child under the age of 18 years in the family. Employment status was defined as being employed at the time of the census in the preceding year. Individuals not in employment included those unemployed, but also students, pensioners, and others (including unknown, conscripts and conscientious objectors). These work-family variables were annually measured between 1987 and 2012, and combined into eight possible work-family combinations based on the values of each of the three variables.

Educational attainment

Educational attainment was based on the highest degree obtained by the individual and divided into four categories: only compulsory education, upper secondary or less education, lower tertiary education, and higher tertiary or more education. Educational attainment at age 42, i.e. end of follow-up, was used to account for completed education, as we expect educational attainment to be related to psychotropic medication purchases, work and family factors, and thus also to the work-family trajectories.

Sequence analysis

Sequence analysis, a methodological framework to analyze trajectories and processes,[47,48] was used to identify common work-family typologies in our data. For each woman, we constructed a work-family trajectory between ages 20 to 42 years based on the eight possible combinations of partnership, parenthood and employment status. The calendar years for these trajectories differed by birth year; for a woman born in 1967, her trajectory started in 1987 and ended in 2009, whereas the trajectory for a woman born in 1970 started in 1990 and ended in 2012 (Table B of the supplemental materials).

Sequence analysis uses the timing of each work-family combination, the order of work-family combinations within a trajectory, and the duration an individual remained in a specific work-family combination to derive distinct clusters of women with similar work-family trajectories. Of the 13554 women in our sample, 12801 women (94.4%) had distinct work-family trajectories.

The distance between the work-family trajectories of any two women in our sample was computed by Optimal Matching, which defines the distance between any two trajectories in terms of the minimum cost of transforming one individuals' trajectory to match another individual's trajectory. We used "Partitioning Around Medoids" (PAM) to estimate cluster membership for every woman in our sample (for any number of possible clusters between 2 and 15). As PAM depends upon the initial choice of medoids (representative objects within a cluster) and could lead to less optimal results, results from a hierarchical cluster method were used to initialize PAM and improve the quality of the clustering.[49] We then estimated several cluster quality measures (Table C of the supplemental materials) to determine the optimal number of clusters.[49,50] Ideally, work-family trajectories of women in the same cluster should be as homogenous as possible, whereas those of women in different clusters should be as heterogeneous as possible. The cluster quality measures, e.g. a low Hubert's C and a relatively high Average Silhouette Width, indicated that the seven cluster solution would be suitable for our sample of Finnish women. With 8 possible work-family combinations at any one point in time, the 7-cluster solution, we believe, provides meaningful typologies that are also distinctively different from the other typologies. The 7 work-family typologies found are: 1. Employed women with a partner, who had children in their 20s; 2. Employed women with a partner, who had children in their 30s; 3. Mothers with a partner, who stayed home before re-entering employment; 4. Lone mothers (employed and not employed); 5. Employed women with a partner, but without children; 6. Employed women without a partner or children; and 7. Women without a partner, children or employment. A graphical representation of the most common work-family combination at each age between 20 and 42 years for the women in each of these seven work-family typologies is shown in Figure 1. Note that the typologies were named based on a generalization of all work-family trajectories within a typology.

However, variation in work-family trajectories among women in each typology exists (Figures A and B of the online supplemental materials).

[Figure 1 here]

Next, a logistic regression model was used to estimate whether the likelihood of having purchased at least one prescription of psychotropic medication in the year that the woman turned 43 years differed between women in the 7 work-family typologies (Model 1). Model 2 was adjusted for educational attainment, as the timing of employment, family decisions and mental health are likely to depend upon a woman's educational level. In Model 3, multiple measures of psychotropic medication purchases earlier in life were added to control for prior differences in mental health. We used purchases at ages 28 to 32 years as these were available for all women in our sample as the medication data started in 1995. Both the sequence analysis (WeightedCluster version 1.2-1[49], TraMineR version 2.0-8[50]) and the logistic regression models were done in R Studio version 1.1.453 with R version 3.3.3.

Results

Distribution of work-family typologies, educational attainment, and psychotropic medication purchases at age 43

Overall, two thirds of the women in our sample were classified as employed women with a partner who had children (66.0%, typologies 1 to 3, Table 1); 28.2% had children in their 20s (typology 1), 23.2% had children in their 30s (typology 2), and 14.6% stayed home before re-entering employment after having children (typology 3). The least common typology was that of women without a partner, children or employment (5.0%, typology 7). The remaining thirty percent was relatively evenly distributed over the remaining typologies; about a tenth of our sample were classified as lone mothers

(9.4%, typology 4), employed women with a partner but without children (9.1%, typology 5), or employed women without a partner or children (10.3%, typology 6).

[Table 1 here]

Compared to lower educated women, women with higher educational attainment were more likely to have been employed with a partner who had children in their 30s (typology 2); for example, 40.2% of the women with higher tertiary or more education were in this typology, compared to only 9.3% of the women with only compulsory education. Similarly, being an employed woman without a partner or children (typology 6) was more common among higher educated women than those with less education. Contrarily, being a mother without a partner who stayed home before re-entering employment (typology 2), a lone mother (typology 4), or not having a partner, children or employment (typology 7) was more common among women with less education than those with higher educational attainment. For example, 18.3% of women with only compulsory education were lone mothers, whereas only 3.8% of women with higher tertiary or more education were in this typology.

Overall, 17.0% of all women had at least one purchase of psychotropic medication in the calendar year they turned 43 years. However, this prevalence differed for women in different work-family typologies. It was highest among women without a partner, children or employment (41.0%; typology 7) and lone mothers (23.3%; typology 4), and lowest among employed mothers with a partner (13.0% for those who had children in their 20s, typology 1; and 13.7% of those who had children in their 30s, typology 2).

Psychotropic medication purchases

No difference in psychotropic medication purchases at age 43 was found between employed women with a partner who had children in their 20s (typology 1) or their 30s (typology 2) in the logistic model

adjusting for birth year (Model 1, Figure 2). Compared to employed women with a partner who had children in their 20s (typology 1), women without a partner, children or employment (typology 7) were over four times as likely to have purchased psychotropic medication (odds ratio [OR]: 4.65, 95% confidence interval [CI]: 3.88, 5.56), whereas lone mothers were twice as likely to have purchased psychotropic medication (OR: 2.03, 95% CI: 1.72, 2.38; typology 4). The women in the remaining three categories were all approximately 40% more likely to have purchased psychotropic medication at age 43 than employed women with a partner who had children in their 20s (typology 1). These results only changed slightly after adjusting for educational attainment (Model 2).

[Figure 2 here]

Adjusting for previous purchases of psychotropic medication at ages 28 to 32 (Model 3) attenuated the observed disadvantages for women in all typologies, except that of employed women with a partner who had children (in their 30s). For example, the disadvantage of mothers with a partner who stayed home before re-entering employment (typology 3) attenuated from 1.37 (95% CI: 1.18, 1.59) to 1.23 (95% CI: 1.04, 1.44). When purchases earlier in life were taken into account, the initial disadvantage for employed women with a partner but without children (typology 5) attenuated to non-significant.

Purchases of antidepressants, antipsychotics, and anxiolytic/sedative/hypnotic (ASH) medication

Of the three subcategories of psychotropic medication, antidepressant purchases were most common (12.2%), ASH medication purchases were less common (8.0%), and purchases of antipsychotics were least common (3.5%). The distributions of these subcategories of psychotropic medication by work-family typology were similar to the one found for any psychotropic medication (Table 2). The ORs of antidepressants and ASH medication purchases for the 7 work-family typologies were comparable in magnitude to those for any psychotropic medication, but those for antipsychotics were higher.

Similarly, adjusting for previous psychotropic medication purchases (Model 3) attenuated the observed disadvantages for women in the work-family typologies other than employed mothers with a partner. Moreover, the disadvantages of employed women with a partner but without children (typology 5) and employed women without a partner or children (typology 6) in terms of antidepressant purchases, and the disadvantage of mothers with a partner who stayed home before re-entering employment (typology 3) in terms of ASH medication purchases were attenuated to non-significant.

[Table 2 here]

Discussion

Summary of results

Seven distinct work-family typologies were found for Finnish women based on partnership, motherhood and employment status. Certain work-family typologies were associated with worse mental health for Finnish women; all women other than employed mothers with a partner were more likely to have purchased any psychotropic medication in mid-life, i.e. at age 43. Especially women without a partner, children or employment and lone mothers were worse off, but also mothers with a partner who stayed home before re-entering employment and employed women without a partner or children were more likely to have purchased psychotropic medication in mid-life. These disadvantages remained after adjusting for educational attainment and psychotropic medication purchases at ages 28 to 32 years, and were also found for antidepressants, antipsychotics, and ASH medication separately. Age at motherhood did not seem to matter for mid-life mental health of employed mothers with a partner.

Methodological considerations

A major strength of this study was the use of data on purchased psychotropic medication from official medication registries, and register data on partnership, parenthood, and employment status rather than using self-reported data for these measures. It therefore does not suffer from biases associated with self-reported measures, such as recall bias (especially with a long follow-up), possible misreporting of mental health, and loss to follow-up among those with mental health problems or those without employment. Additionally, we were able to study partnerships in general and not only (legal) marital status, as Finland is one of the few countries that has registry data on cohabitation status going back to 1987.

Purchases of prescribed psychotropic medication were used as a proxy for mental health. It is an objective measure and a good indicator of poorer mental health, but it is not perfect. For example, not all psychiatric disorders are diagnosed, psychotropic medication may be prescribed for other reasons than psychiatric disorders, and individuals who were diagnosed with psychiatric disorders may not purchase their prescribed psychotropic medication.[51,52] Drawing conclusions on overall mental health based on results using purchased psychotropic medication should thus be done carefully. However, the use of antidepressants without a known psychiatric morbidity tends to increase only at older ages.[52]

The quality measures used to determine the optimal number of clusters, indicated that besides a seven cluster solution, a five or ten cluster solution would also be suitable for our data. On the one hand, the five cluster solution provided a typology combining employed mothers with a partner irrespective of when they had children, and a typology combining women without a partner or children irrespective of whether they were employed (results available upon request). Conclusions were generally similar to those of the seven cluster solution. However, by restricting the number of typologies, we would have overlooked the mental health differences between employed women without a partner or children and women without a partner, children or employment. On the other hand, the ten cluster solution split employed mothers with a partner into four categories (rather than two) based on different timings of partnership and motherhood, and it additionally distinguished

between lone mothers with and without employment (results available upon request). Overall, conclusions were similar to those of the seven cluster solution. The ten cluster solution allowed us to specifically look at lone mothers without employment, who were worse off in terms of their psychotropic medication purchases, and in particular antipsychotics. However, allowing for more work-family typologies mainly resulted in more categories of employed mothers with a partner, who were similar in their psychotropic medication purchases. Therefore we believe that the seven cluster solution provided representative typologies indicating the more (and less) disadvantaged groups of women in our data.

One may also argue that only considering psychotropic medication purchases in the year the woman turned 43 years may cover a too narrow time period for reporting mid-life mental health. To check the robustness of our findings, we used a binary outcome based on having purchased at least one prescription of psychotropic medication in the calendar years in which the woman turned 41 to 43 years. This shortened the work-family trajectories to cover ages 20 to 40 years. Based on these slightly shorter work-family trajectories, we found seven very similar work-family typologies (results available upon request). Overall, conclusions were very similar to those based on the original work-family trajectories from ages 20 to 42 years.

As women have been most likely to feel competing demands of combining work and family life, this study focused on their work-family trajectories and mental health. Nevertheless, men have been spending more time doing core housework tasks more recently.[45] Competing demands may thus play a more important role for men's mental health in recent times than it has in the past. Gender differences in the association of work-family life and mental health have been shown; mental health benefits of full-time employment increased over the life course for men, but women women's mental health benefitted increasingly as children grow older.[53] Future research should therefore also consider work-family trajectories of men and their association with mental health.

Interpretation

Employed mothers with a partner had better mental health than women with other work-family trajectories. This finding is consistent with the role accumulation hypothesis and in line with several previous studies.[22–28] Employed women with a partner who had children in their 20s or their 30s did not differ in their likelihood of purchasing psychotropic medication in mid-life. Hence, age at motherhood did not seem to lead to mental health differences later in life for employed women with a partner. However, selection into partnership, parenthood, and employment may have played an important role in this finding; healthier individuals are more likely to marry or cohabit, become parents, and be employed. Controlling for psychotropic medication purchases at earlier ages attenuated some of this advantage, indicating that at least part of the association is attributable to the selection of healthier women into partnerships, motherhood, and employment.

Mothers with a partner, who stayed home before they re-entered employment after having children were more likely to have purchased psychotropic medication at age 43 years than mothers who re-entered employment within a few years after having children. Being a stay-at-home mother longer may have a greater influence on a woman's financial (in)dependence, may reduce social networks more, and lead to greater social isolation,[54] which could result in worse mental health. However, these women may have chosen to stay home longer due to (mental) health reasons, therefore health selection into staying home may also play a role. Adjusting for psychotropic medication purchases at ages 28 to 32 only slightly attenuated these findings, indicating that not all of this association can be explained by health selection into roles.

Lone mothers were more likely than employed mothers with a partner to have purchased psychotropic medication in mid-life. This finding is consistent with findings from other studies; for example, lone mothers were more likely to report depressive symptoms,[55–57] psychological distress,[58] or mental disability[59] than partnered mothers. Lone mothers are raising their children without the support of a partner, while they may also have the additional responsibility of being the breadwinner in the family. This could all lead to increased stress. Additionally, lack of employment may be even more problematic for lone mothers as there is no partner to share their financial responsibilities with.

Therefore, one reason for the mental health difference between lone and partnered mothers may be financial hardship, as lone mothers may be more likely to have less favorable financial circumstances than partnered mothers.[58,59] The exact impact of these less favorable financial circumstances on differences in psychotropic medication purchases over the life course between lone and partnered mothers in Finland remains to be examined.

Employed women with a partner but without children were more likely to have purchased psychotropic medication in mid-life than employed mothers with a partner. After taking previous psychotropic medication purchases into account, these differences in psychotropic medication purchases were no longer observed, suggesting health selection into childlessness. As our work-family trajectories only go up to age 42, this group of women without children was very diverse; it includes women who may be voluntarily childless, involuntarily childless, who had children in their late 30s, or who may have children in their 40s. Information on whether a woman was voluntarily or involuntarily childless was not available, so unfortunately possible mental health differences between these women could not be examined. However, our findings suggest that the mental health of these women together is not worse than that of employed mothers with a partner after adjusting for previous psychotropic medication purchases.

Overall, employed women without a partner or children were slightly worse off than employed mothers with a partner. This is in line with extensive research stating that not having a partner may have detrimental effects on an individual's health, as being in a partnership is an important source of social support and could increase the economic resources available to an individual.[60] This may then positively influence health.[61] However, compared to women who were additionally not employed, employed women without a partner or children were less likely to have purchased psychotropic medication in mid-life. This finding highlights the importance of employment for one's mental health in the absence of a partnership or motherhood.

Women without a partner, children or employment were most likely to have purchased psychotropic medication at age 43. This finding is in line with the literature stating that women who

do not have a partner, children or employment are disadvantaged in terms of their health.[1–13,16,19–22] Health selection into partnership, parenthood, and employment partly explained this higher likelihood of purchasing psychotropic medication as the disadvantage of women without a partner, children or employment was strongly attenuated after adjusting for psychotropic medication purchases earlier in life.

Conclusion

Overall, our results showed that compared to employed women with a partner, women with other work-family trajectories had worse mental health. Among women with steady employment and stable partnerships, the age of motherhood did not seem to matter for their mental health. However, especially women without a partner, children or employment, and lone mothers had worse mental health. Adjusting for previous psychotropic medication purchases to capture potential health selection processes attenuated the mental health differences, but overall the disadvantages remained. Adequate interventions and policies to improve the mental health of unpartnered women, including lone mothers, and women without employment may be needed. Our results nevertheless suggest that women combining partnership, parenthood, and employment had better mental health than women not fulfilling all three roles.

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Online supplemental Tables and Figures

Table A – Comparing characteristics of women included and excluded from the sample

	Women excluded from sample (N=1443)		Women included in sample (N=13554)	
	N	No. (%)	N	No. (%)
Number of observations	1443		13554	
23		NA		13554
22 (i.e. missing 1 yearly observation)		191 (13.2)		NA
21 (i.e. missing 2 yearly observations)		142 (9.8)		NA
20 (i.e. missing 3 yearly observations)		147 (10.2)		NA
19 (i.e. missing 4 yearly observations)		100 (3.9)		NA
18 (i.e. missing 5 yearly observations)		87 (6.0)		NA
17 (i.e. missing 6 yearly observations)		73 (5.1)		NA
16 (i.e. missing 7 yearly observations)		51 (3.5)		NA
15 (i.e. missing 8 yearly observations)		55 (3.8)		NA
14 (i.e. missing 9 yearly observations)		46 (3.2)		NA
13 (i.e. missing 10 yearly observations)		42 (2.9)		NA
12 (i.e. missing 11 yearly observations)		43 (3.0)		NA
11 (i.e. missing 12 yearly observations)		48 (3.3)		NA
10 (i.e. missing 13 yearly observations)		41 (2.8)		NA
9 (i.e. missing 14 yearly observations)		37 (2.6)		NA
8 (i.e. missing 15 yearly observations)		37 (2.6)		NA
7 (i.e. missing 16 yearly observations)		45 (3.1)		NA
6 (i.e. missing 17 yearly observations)		47 (3.3)		NA
5 (i.e. missing 18 yearly observations)		27 (1.9)		NA
4 (i.e. missing 19 yearly observations)		42 (2.9)		NA
3 (i.e. missing 20 yearly observations)		33 (2.3)		NA
2 (i.e. missing 21 yearly observations)		26 (1.8)		NA
1 (i.e. missing 22 yearly observations)		46 (3.2)		NA
0 (i.e. missing all 23 yearly observations)		37 (2.6)		NA
Birth year	1443		13554	
1967		368 (26.8)		3620 (26.7)
1968		382 (26.5)		3504 (25.9)
1969		341 (23.6)		3272 (24.1)
1970		334 (23.2)		3158 (23.3)
Education	1443		13554	
Higher tertiary or more		276 (19.1)		2268 (16.7)
Lower tertiary		397 (27.5)		4865 (35.9)
Upper secondary		463 (32.1)		5222 (38.5)
Only compulsory		270 (18.7)		1199 (8.9)
Missing		37 (2.6)		NA
At least one psychotropic medication purchase				
At age 43	685	116 (16.9)	13554	2309 (17.0)
At age 42	698	70 (10.0)	13554	1682 (12.4)
At age 41	707	48 (6.8)	13554	1074 (7.9)
At age 40	723	58 (8.0)	13554	1103 (8.1)
At age 39	746	55 (7.4)	13554	998 (7.4)
At age 38	750	74 (9.9)	13554	1304 (9.6)
At age 37	770	100 (13.0)	13554	1544 (11.4)
At age 36	789	80 (10.1)	13554	1367 (10.1)
At age 35	824	77 (9.3)	13554	1208 (8.9)
At age 34	835	71 (8.5)	13554	1110 (8.2)
At age 33	859	72 (8.4)	13554	1060 (7.8)
At age 32	880	76 (8.6)	13554	981 (7.2)
At age 31	923	71 (7.7)	13554	933 (6.9)
At age 30	957	64 (6.7)	13554	851 (6.3)
At age 29	1008	64 (6.4)	13554	764 (5.6)
At age 28	1044	78 (7.5)	13554	701 (5.2)

Note. Education for those excluded from the sample is the educational level lastly measured for each woman.

613 Table B – Visual representation of the data structure

	Calendar year																												
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Birth year																											
1967	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
1968	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
1969	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1970	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43

614 ☐ Years used for work-family trajectory. ☐ Calendar year used for psychotropic mediation measure.

615

616 Table C – Overview of the quality measures

	Quality measures									
	PBC Max	HG Max	HGSD Max	ASW Max	ASWw Max	CH Max	R2 Max	CHsq Max	R2sq Max	HC Min
Number of clusters										
2	0.63	0.76	0.76	0.33	0.33	2581.64	0.16	5560.91	0.29	0.12
3	0.53	0.64	0.64	0.21	0.21	1859.63	0.22	4013.72	0.37	0.18
4	0.57	0.70	0.70	0.22	0.22	1594.02	0.26	3611.03	0.44	0.15
5	0.61	0.78	0.78	0.24	0.24	1518.98	0.31	3686.31	0.52	0.11
6	0.53	0.76	0.76	0.21	0.21	1427.04	0.34	3514.56	0.56	0.13
7	0.55	0.79	0.79	0.22	0.22	1345.22	0.37	3466.53	0.61	0.11
8	0.51	0.79	0.79	0.20	0.20	1219.58	0.39	3156.34	0.62	0.11
9	0.47	0.77	0.77	0.19	0.19	1123.46	0.40	2915.51	0.63	0.13
10	0.47	0.79	0.79	0.19	0.19	1055.46	0.41	2806.37	0.65	0.12
11	0.43	0.78	0.78	0.18	0.18	1001.27	0.43	2673.07	0.66	0.13
12	0.42	0.79	0.79	0.17	0.17	932.79	0.43	2511.18	0.67	0.12
13	0.41	0.80	0.80	0.17	0.17	875.68	0.44	2371.61	0.68	0.12
14	0.40	0.79	0.79	0.15	0.15	825.92	0.44	2242.44	0.68	0.13
15	0.39	0.80	0.80	0.16	0.16	793.41	0.45	2170.21	0.69	0.12

617 *Note.* PBC: Point Biserial Correlation. HG: Hubert's Gamma. HGSD: Hubert's Somers D. ASW: Average Silhouette Width. CH: Calinski-Harabasz
618 index. CHsq: Calinski-Harabasz index using squared distances. R2: Pseudo R^2. R2: Pseudo R^2 using squared distances. HC: Hubert's C.

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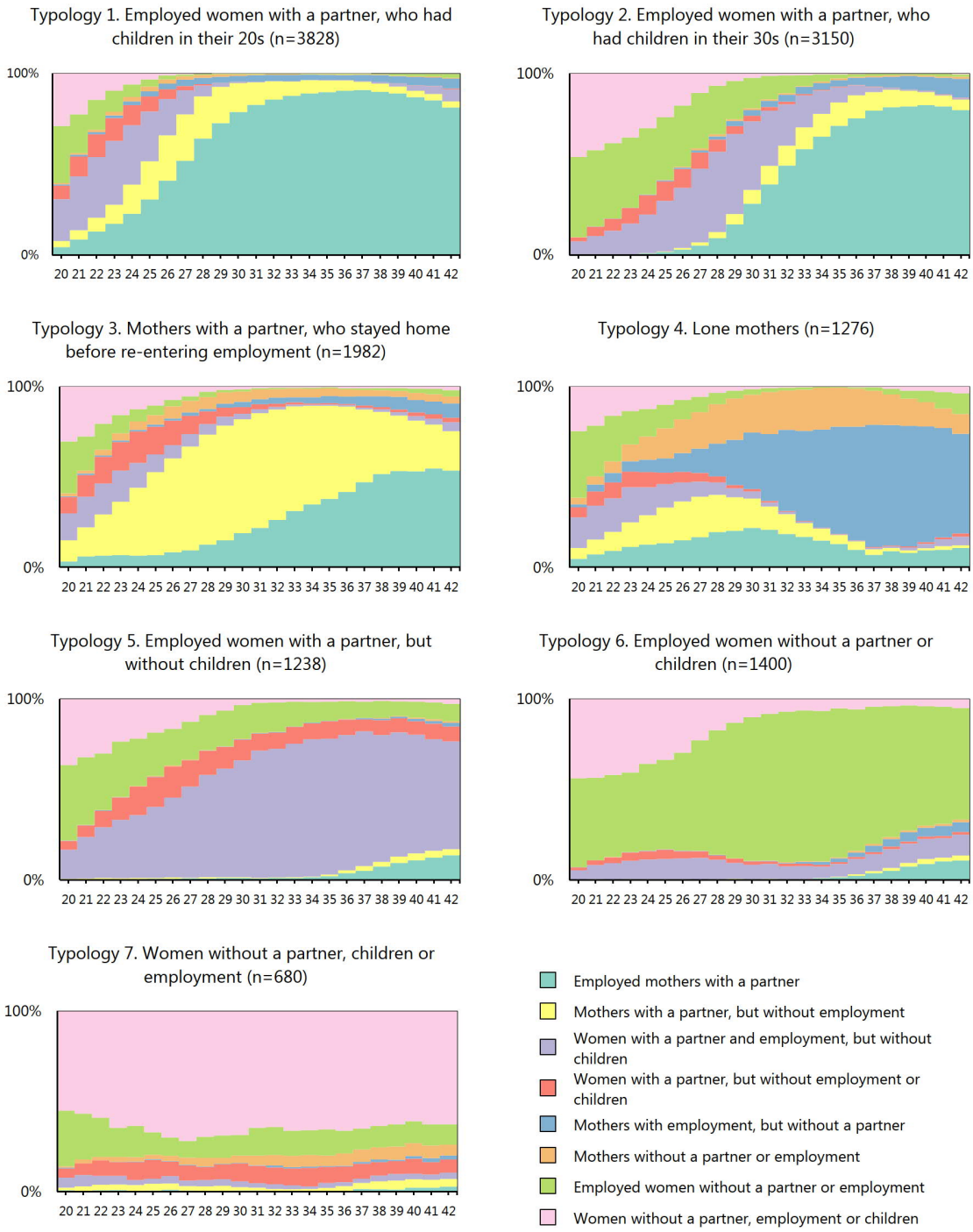
620 Figure A – Index plots for the 7 work-family typologies



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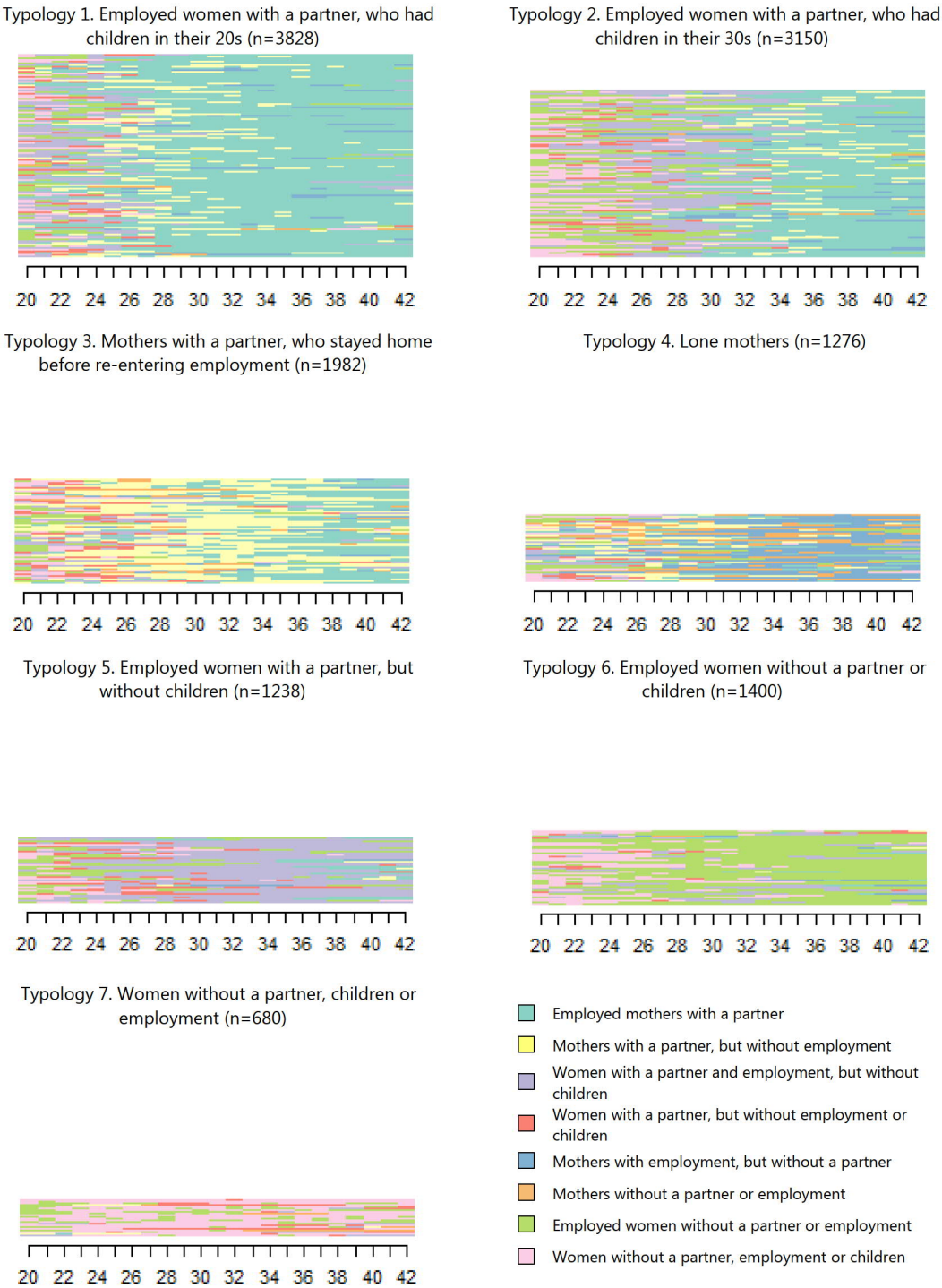
622

623 Figure B – Index plots for the 7 work-family typologies



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625

626 Table D – Odds ratios of psychotropic medication purchases for the 7 work-family typologies

	Psychotropic medication purchases		
	Model 1	Model 2	Model 3
Controlled for:	Birth year	Birth year, education	Birth year, education, previous purchases
Work-family typologies			
Typology 1. Employed women with a partner, who had children in their 20s	Ref.	Ref.	Ref.
Typology 2. Employed women with a partner, who had children in their 30s	1.06 (0.92, 1.22)	1.07 (0.93, 1.23)	1.06 (0.92, 1.23)
Typology 3. Mothers with a partner, who stayed home before re-entering employment	1.41 (1.21, 1.63)	1.37 (1.18, 1.59)	1.23 (1.04, 1.44)
Typology 4. Lone mothers	2.03 (1.72, 2.38)	1.94 (1.65, 2.28)	1.72 (1.44, 2.05)
Typology 5. Employed women with a partner, but without children	1.38 (1.15, 1.64)	1.38 (1.15, 1.64)	1.11 (0.91, 1.35)
Typology 6. Employed women without a partner or children	1.43 (1.21, 1.68)	1.44 (1.21, 1.70)	1.24 (1.06, 1.49)
Typology 7. Women without a partner, children or employment	4.65 (3.88, 5.56)	4.28 (3.57, 5.14)	1.88 (1.50, 2.36)

627

Tables and Figures

Figure 1 – Most frequent work-family combination at each age by work-family typologies

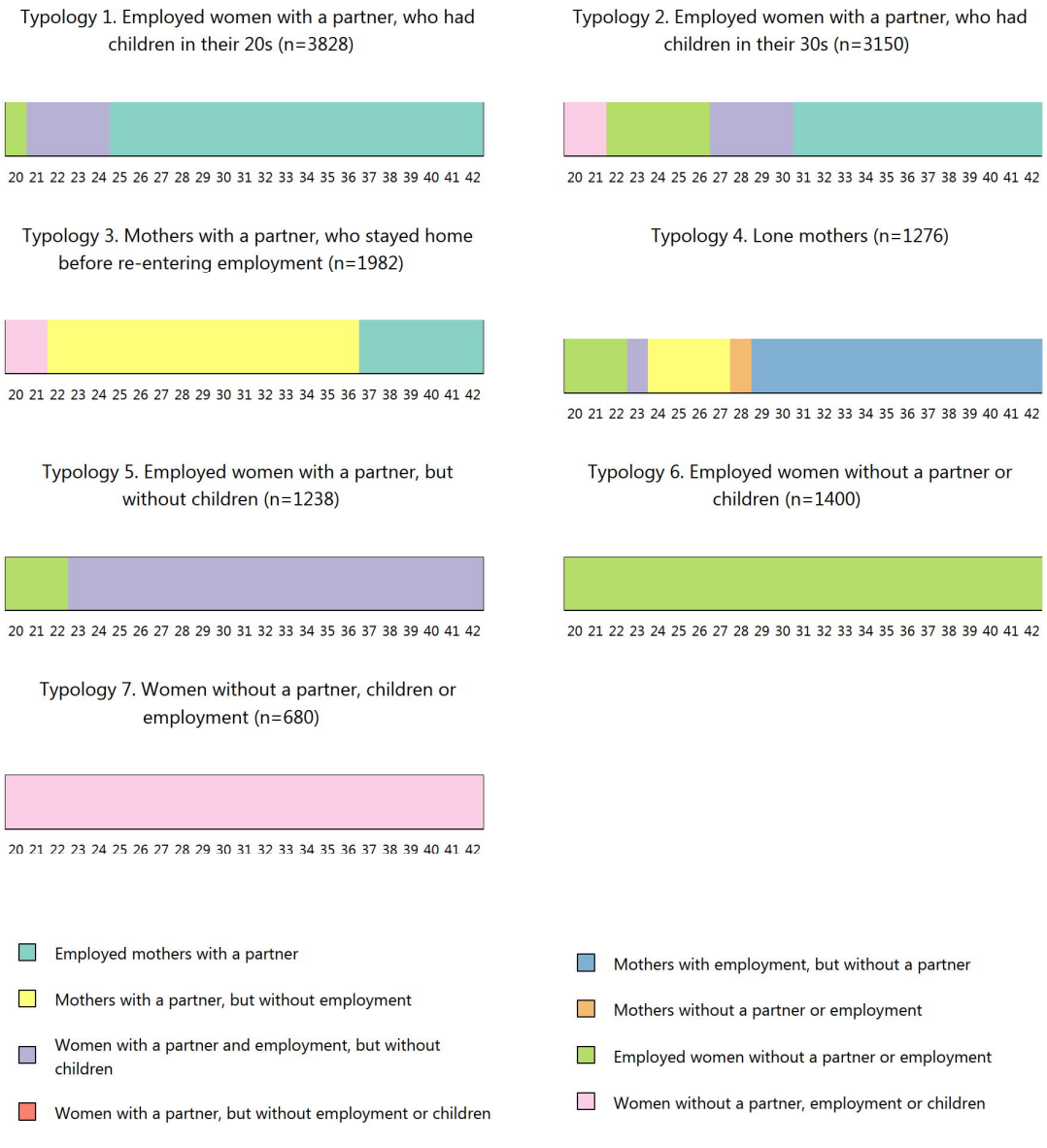
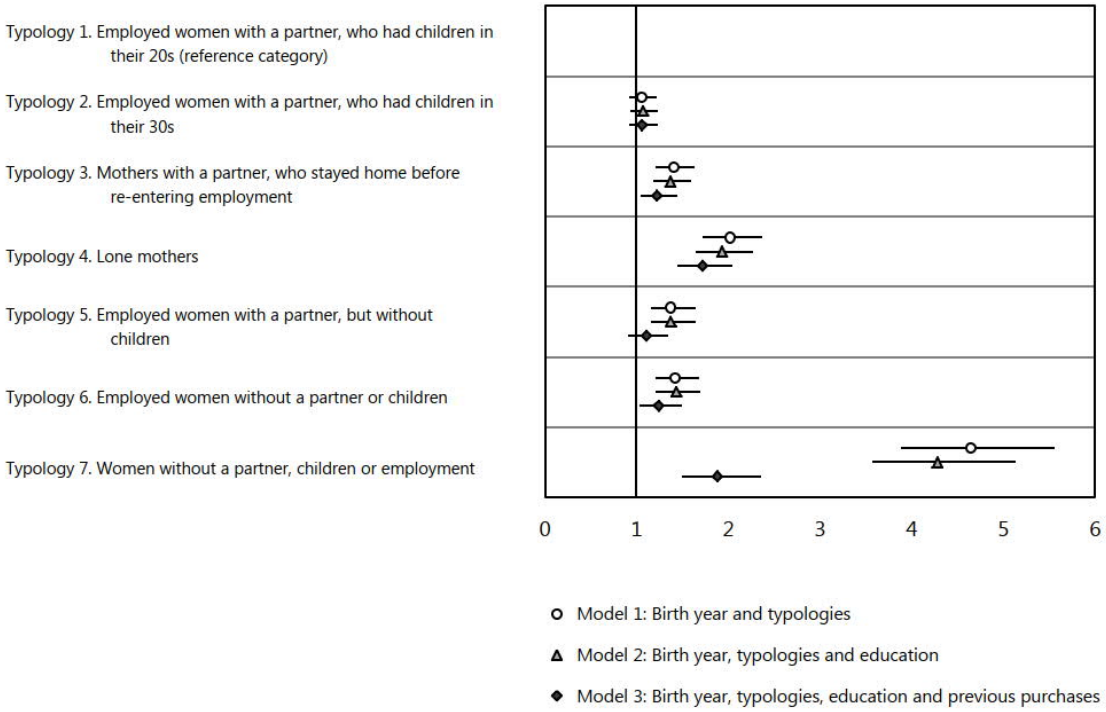


Table 1 – Distributions of the 7 work-family typologies, of educational attainment within work-family typologies, and proportions of psychotropic medication purchases by work-family typology

	All women		Typology 1.	Typology 2.	Typology 3.	Typology 4.	Typology 5.	Typology 6.	Typology 7.
	No.	%	Employed women with a partner, who had children in their 20s	Employed women with a partner, who had children in their 30s	Mothers with a partner, who stayed home before re-entering employment	Lone mothers	Employed women with a partner, but without children	Employed women without a partner or children	Women without a partner, children or employment
Distribution of work-family typologies	13554		28.2	23.2	14.6	9.4	9.1	10.3	5.0
Distribution of work-family typology by education									
Only compulsory	1199	8.8	22.9	9.3	21.6	18.3	7.3	5.8	14.8
Upper secondary	5222	38.5	30.7	15.3	18.7	11.6	8.9	8.9	5.9
Lower tertiary	4865	35.9	30.0	27.4	11.9	7.5	9.8	10.9	2.6
Higher tertiary or more	2268	16.7	21.5	40.2	7.3	3.8	9.3	15.0	2.9
Proportion of women with at least one psychotropic medication purchase in the year she turned 43 years:									
All psychotropic medication	2309	17.0	13.0	13.7	17.4	23.3	17.1	17.6	41.0
Antidepressants	1656	12.2	9.7	9.7	13.1	17.6	12.5	12.4	25.0
Antipsychotics	473	3.5	1.5	1.6	3.7	3.5	3.7	3.0	23.4
ASH medication	1091	8.0	5.9	6.2	7.9	10.9	8.8	9.4	20.1
Proportion of women with at least one psychotropic medication purchase, in the year she turned:									
28 years	701	5.2	3.1	3.2	4.8	5.2	6.1	5.9	24.0
29 years	764	5.6	3.2	3.7	5.4	6.0	6.8	5.4	26.6
30 years	851	6.3	3.5	4.0	6.5	7.9	6.8	6.4	27.5
31 years	933	6.9	4.2	4.4	6.9	8.1	8.5	6.2	29.3
32 years	981	7.2	4.6	4.1	7.3	9.9	8.4	7.6	29.0

Note. No.: Absolute number of women. %: percentage of women with medication purchases or in specific educational levels . The prevalence of antidepressants, antipsychotics, and ASH medication does not necessarily sum up to that of all psychotropic medication as women may be using more than one type at the same time.

Figure 2 – Odds ratios of having purchased psychotropic medication for women in the 7 work-family typologies



Note. Error bars represent the 95% confidence interval. Full information on point estimates and 95% confidence intervals can be found in Table D of the supplemental materials. Model 1 includes birth year and the work-family typologies. In Model 2, educational attainment at age 42 years was added. Model 3 additionally adjusts for previous psychotropic medication purchases at ages 28 to 32 years.

Table 2 – Odds ratios of psychotropic medication subcategories for the 7 work-family typologies

	Antidepressants			Antipsychotics			ASH medication		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Controlled for:	Birth year	Birth year, education	Birth year, education, previous purchases	Birth year	Birth year, education	Birth year, education, previous purchases	Birth year	Birth year, education	Birth year, education, previous purchases
Work-family typologies									
Typology 1. Employed women with a partner, who had children in their 20s	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Typology 2. Employed women with a partner, who had children in their 30s	1.00 (0.85, 1.18)	1.03 (0.87, 1.21)	1.04 (0.88, 1.23)	1.01 (0.69, 1.48)	1.09 (0.74, 1.59)	1.00 (0.67, 1.48)	1.06 (0.87, 1.29)	1.06 (0.87, 1.30)	1.03 (0.84, 1.26)
Typology 3. Mothers with a partner, who stayed home before re-entering employment	1.41 (1.19, 1.67)	1.37 (1.15, 1.62)	1.24 (1.04, 1.49)	2.44 (1.73, 3.47)	2.31 (1.63, 3.28)	1.87 (1.29, 2.72)	1.38 (1.12, 1.71)	1.34 (1.08, 1.65)	1.24 (0.99, 1.55)
Typology 4. Lone mothers	1.99 (1.66, 2.38)	1.91 (1.58, 2.28)	1.70 (1.40, 2.05)	2.33 (1.57, 3.45)	2.15 (1.44, 3.18)	2.25 (1.50, 3.35)	1.97 (1.57, 2.45)	1.86 (1.48, 2.32)	1.71 (1.35, 2.16)
Typology 5. Employed women with a partner, but without children	1.34 (1.09, 1.63)	1.34 (1.10, 1.63)	1.16 (0.94, 1.44)	2.47 (1.66, 3.64)	2.50 (1.68, 3.69)	1.77 (1.14, 2.71)	1.55 (1.22, 1.97)	1.55 (1.21, 1.96)	1.32 (1.02, 1.69)
Typology 6. Employed women without a partner or children	1.32 (1.09, 1.60)	1.34 (1.10, 1.62)	1.17 (0.95, 1.44)	1.97 (1.31, 2.93)	2.06 (1.37, 3.07)	1.66 (1.07, 2.53)	1.67 (1.33, 2.08)	1.67 (1.33, 2.09)	1.49 (1.17, 1.89)
Typology 7. Women without a partner, children or employment	3.12 (2.54, 3.82)	2.89 (2.35, 3.55)	1.65 (1.29, 2.09)	19.5 (14.4, 26.8)	17.2 (12.6, 23.8)	7.08 (4.88, 10.3)	4.07 (3.22, 5.12)	3.63 (2.86, 4.59)	2.09 (1.59, 2.73)

Note. Ref.: reference category. 95% confidence intervals in the brackets. ASH medication: anxiolytic/sedative/hypnotic medication.

Online supplemental Tables and Figures

Table A – Comparing characteristics of women included and excluded from the sample

		Women excluded from sample (N=1443)		Women included in sample (N=13554)	
		N	No. (%)	N	No. (%)
Number of observations		1443		13554	
23			NA		13554
22	(i.e. missing 1 yearly observation)		191 (13.2)		NA
21	(i.e. missing 2 yearly observations)		142 (9.8)		NA
20	(i.e. missing 3 yearly observations)		147 (10.2)		NA
19	(i.e. missing 4 yearly observations)		100 (3.9)		NA
18	(i.e. missing 5 yearly observations)		87 (6.0)		NA
17	(i.e. missing 6 yearly observations)		73 (5.1)		NA
16	(i.e. missing 7 yearly observations)		51 (3.5)		NA
15	(i.e. missing 8 yearly observations)		55 (3.8)		NA
14	(i.e. missing 9 yearly observations)		46 (3.2)		NA
13	(i.e. missing 10 yearly observations)		42 (2.9)		NA
12	(i.e. missing 11 yearly observations)		43 (3.0)		NA
11	(i.e. missing 12 yearly observations)		48 (3.3)		NA
10	(i.e. missing 13 yearly observations)		41 (2.8)		NA
9	(i.e. missing 14 yearly observations)		37 (2.6)		NA
8	(i.e. missing 15 yearly observations)		37 (2.6)		NA
7	(i.e. missing 16 yearly observations)		45 (3.1)		NA
6	(i.e. missing 17 yearly observations)		47 (3.3)		NA
5	(i.e. missing 18 yearly observations)		27 (1.9)		NA
4	(i.e. missing 19 yearly observations)		42 (2.9)		NA
3	(i.e. missing 20 yearly observations)		33 (2.3)		NA
2	(i.e. missing 21 yearly observations)		26 (1.8)		NA
1	(i.e. missing 22 yearly observations)		46 (3.2)		NA
0	(i.e. missing all 23 yearly observations)		37 (2.6)		NA
Birth year		1443		13554	
1967			368 (26.8)		3620 (26.7)
1968			382 (26.5)		3504 (25.9)
1969			341 (23.6)		3272 (24.1)
1970			334 (23.2)		3158 (23.3)
Education		1443		13554	
Higher tertiary or more			276 (19.1)		2268 (16.7)
Lower tertiary			397 (27.5)		4865 (35.9)
Upper secondary			463 (32.1)		5222 (38.5)
Only compulsory			270 (18.7)		1199 (8.9)
Missing			37 (2.6)		NA
At least one psychotropic medication purchase					
At age 43		685	116 (16.9)	13554	2309 (17.0)
At age 42		698	70 (10.0)	13554	1682 (12.4)
At age 41		707	48 (6.8)	13554	1074 (7.9)
At age 40		723	58 (8.0)	13554	1103 (8.1)
At age 39		746	55 (7.4)	13554	998 (7.4)
At age 38		750	74 (9.9)	13554	1304 (9.6)
At age 37		770	100 (13.0)	13554	1544 (11.4)
At age 36		789	80 (10.1)	13554	1367 (10.1)
At age 35		824	77 (9.3)	13554	1208 (8.9)
At age 34		835	71 (8.5)	13554	1110 (8.2)
At age 33		859	72 (8.4)	13554	1060 (7.8)
At age 32		880	76 (8.6)	13554	981 (7.2)
At age 31		923	71 (7.7)	13554	933 (6.9)
At age 30		957	64 (6.7)	13554	851 (6.3)
At age 29		1008	64 (6.4)	13554	764 (5.6)
At age 28		1044	78 (7.5)	13554	701 (5.2)

Note. Education for those excluded from the sample is the educational level lastly measured for each woman.

Table B – Visual representation of the data structure

	Calendar year																										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Birth year																											
1967	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
1968	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
1969	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1970	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43

Years used for work-family trajectory. Calendar year used for psychotropic mediation measure.

Table C – Overview of the quality measures

	Quality measures									
	PBC	HG	HGSD	ASW	ASWw	CH	R2	CHsq	R2sq	HC
	Max	Max	Max	Max	Max	Max	Max	Max	Max	Min
Number of clusters										
2	0.63	0.76	0.76	0.33	0.33	2581.64	0.16	5560.91	0.29	0.12
3	0.53	0.64	0.64	0.21	0.21	1859.63	0.22	4013.72	0.37	0.18
4	0.57	0.70	0.70	0.22	0.22	1594.02	0.26	3611.03	0.44	0.15
5	0.61	0.78	0.78	0.24	0.24	1518.98	0.31	3686.31	0.52	0.11
6	0.53	0.76	0.76	0.21	0.21	1427.04	0.34	3514.56	0.56	0.13
7	0.55	0.79	0.79	0.22	0.22	1345.22	0.37	3466.53	0.61	0.11
8	0.51	0.79	0.79	0.20	0.20	1219.58	0.39	3156.34	0.62	0.11
9	0.47	0.77	0.77	0.19	0.19	1123.46	0.40	2915.51	0.63	0.13
10	0.47	0.79	0.79	0.19	0.19	1055.46	0.41	2806.37	0.65	0.12
11	0.43	0.78	0.78	0.18	0.18	1001.27	0.43	2673.07	0.66	0.13
12	0.42	0.79	0.79	0.17	0.17	932.79	0.43	2511.18	0.67	0.12
13	0.41	0.80	0.80	0.17	0.17	875.68	0.44	2371.61	0.68	0.12
14	0.40	0.79	0.79	0.15	0.15	825.92	0.44	2242.44	0.68	0.13
15	0.39	0.80	0.80	0.16	0.16	793.41	0.45	2170.21	0.69	0.12

Note. PBC: Point Biserial Correlation. HG: Hubert's Gamma. HGSD: Hubert's Somers D. ASW: Average Silhouette Width. CH: Calinski-Harabasz index. CHsq: Calinski-Harabasz index using squared distances. R2: Pseudo R^2. R2: Pseudo R^2 using squared distances. HC: Hubert's C.

Figure A – Index plots for the 7 work-family typologies

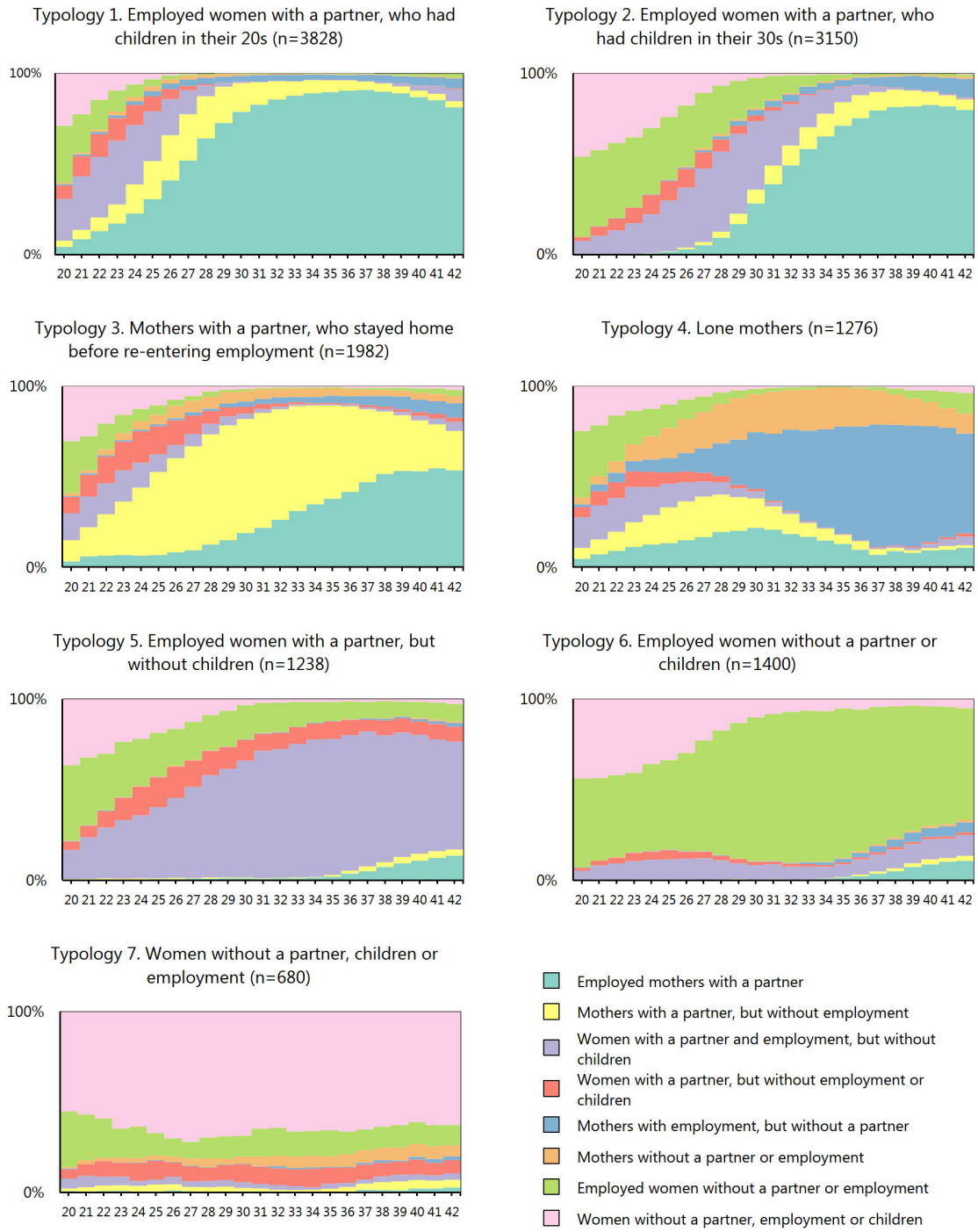
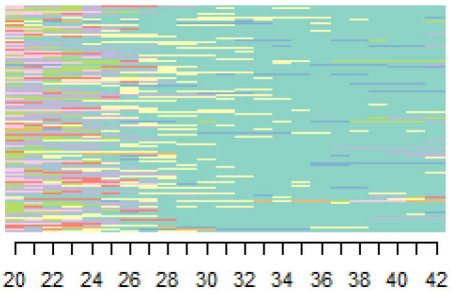
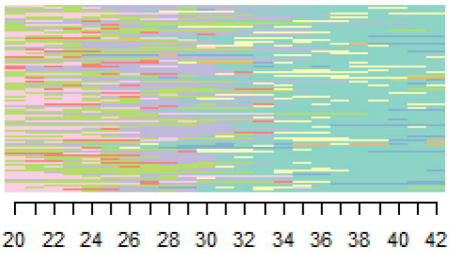


Figure B – Index plots for the 7 work-family typologies

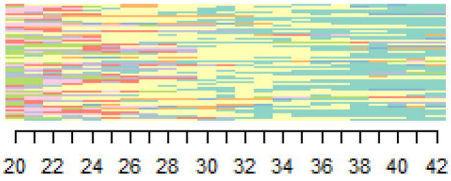
Typology 1. Employed women with a partner, who had children in their 20s (n=3828)



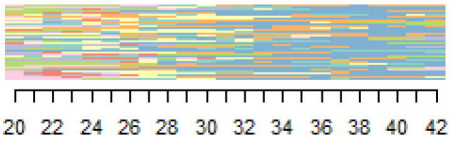
Typology 2. Employed women with a partner, who had children in their 30s (n=3150)



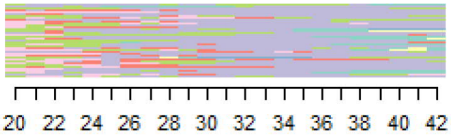
Typology 3. Mothers with a partner, who stayed home before re-entering employment (n=1982)



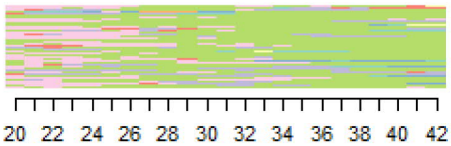
Typology 4. Lone mothers (n=1276)



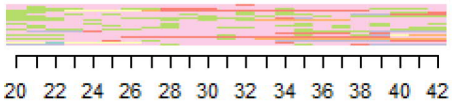
Typology 5. Employed women with a partner, but without children (n=1238)



Typology 6. Employed women without a partner or children (n=1400)



Typology 7. Women without a partner, children or employment (n=680)



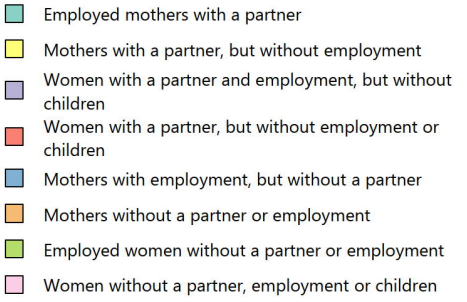


Table D – Odds ratios of psychotropic medication purchases for the 7 work-family typologies

	Psychotropic medication purchases		
	Model 1	Model 2	Model 3
Controlled for:	Birth year	Birth year, education	Birth year, education, previous purchases
Work-family typologies			
Typology 1. Employed women with a partner, who had children in their 20s	Ref.	Ref.	Ref.
Typology 2. Employed women with a partner, who had children in their 30s	1.06 (0.92, 1.22)	1.07 (0.93, 1.23)	1.06 (0.92, 1.23)
Typology 3. Mothers with a partner, who stayed home before re-entering employment	1.41 (1.21, 1.63)	1.37 (1.18, 1.59)	1.23 (1.04, 1.44)
Typology 4. Lone mothers	2.03 (1.72, 2.38)	1.94 (1.65, 2.28)	1.72 (1.44, 2.05)
Typology 5. Employed women with a partner, but without children	1.38 (1.15, 1.64)	1.38 (1.15, 1.64)	1.11 (0.91, 1.35)
Typology 6. Employed women without a partner or children	1.43 (1.21, 1.68)	1.44 (1.21, 1.70)	1.24 (1.06, 1.49)
Typology 7. Women without a partner, children or employment	4.65 (3.88, 5.56)	4.28 (3.57, 5.14)	1.88 (1.50, 2.36)